United States
Environmental Protection
Agency

Office of Research and
Development
Washington DC 20460

EPA/600/F-97/017
November 1997
www.epa.gov/ncerqa

1998 Water and Watersheds Research

EPA/NSF/USDA PARTNERSHIP FOR ENVIRONMENTAL RESEARCH

Opening Date: November 28, 1997

Closing Date: April 1, 1998

Environmental Protection Agency

National Science Foundation

Department of Agriculture

EPA / NSF / USDA PARTNERSHIP FOR ENVIRONMENTAL RESEARCH

Interagency Announcement of Opportunity

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1.0 INTRODUCTION

The Environmental Protection Agency (EPA), the National Science Foundation (NSF), and the U.S. Department of Agriculture (USDA) announce their intent to support a special awards competition in Fiscal Year (FY) 1998. This competition has been developed based on a Memorandum of Understanding between EPA and NSF in collaboration with USDA which establishes a partnership emphasizing the support and merit review of fundamental, extramural environmental research. NSF and EPA's Office of Research and Development are continuing their cooperation in this extramural grants program in FY 1998. This is the fourth year of the joint special awards competition and the first year with USDA. Information on the FY 1995 through 1997 competitions may be found on the Internet through: http://www.nsf.gov or http://www.epa.gov/ncerqa

This year's EPA/NSF Partnership competitions will include the following four research areas:

A. Water and Watersheds

B. Technology for a Sustainable Environment

C. Decision-making and Valuation for Environmental Policy

D. Environmental Statistics

This announcement solicits applications for the Water and Watersheds competition, EPA, NSF, and USDA anticipate awarding:

- Approximately $9 million with a projected award range from $100,000 to $300,000 per award per year and an approximate duration of 2 to 3 years. Total budgets should not exceed these guidelines. Proposals that request greater amounts will not be accepted into the competition.

Awards made through this competition are dependent upon responsiveness of the proposals to the announcement, the quality of the proposed research, and the availability of funds.

Proposals in response to this announcement must be received by April 1, 1998. It is anticipated that awards will be made by Fall 1998. Awards resulting from this competition may be made by either EPA, NSF, or USDA at the option of the agencies, not the grantee.

Further information, if needed, may be obtained from the EPA, NSF, or USDA officials indicated below. E-mail inquiries are the preferred communication method.

GENERAL INFORMATION ON THE COMPETITION:

Dr. Robert E. Menzer
EPA National Center for Environmental Research and Quality Assurance
menzer.robert@epamail.epa.gov
voice (202) 564-6849

Dr. James L. Edwards
NSF Directorate for Biological Sciences
jledward@nsf.gov
voice (703) 306-1400

Dr. Elbert L. Marsh
NSF Directorate for Engineering
emarsh@nsf.gov
voice (703) 306-1301

Mr. Jeff Fenstermacher
NSF Directorate for Social, Behavioral, and Economic Sciences
jfenster@nsf.gov
voice (703) 306-1741

Information on Water and Watersheds:

Ms. Barbara Levinson
levinson.barbara@epamail.epa.gov
voice (202) 564-6911

Dr. Penny Firth
pfirth@nsf.gov
voice (703) 306-1480

Dr. Maurice Horton
mhorton@reeusda.gov
voice (202) 401-5971

2.0 WATER AND WATERSHEDS

2.1 Introduction

The goal of the Water and Watersheds competition is to develop an improved understanding of the natural and anthropogenic processes that govern the quantity, quality, and availability of water resources in natural and human-dominated systems, and an understanding of the structure, function, and dynamics of the coupled terrestrial and aquatic ecosystems that comprise watersheds.

Human activities have made access to clean water and healthy aquatic ecosystems paramount issues in the U.S. and throughout the world. The integrated nature of watersheds, the landscape units that integrate terrestrial, aquatic, atmospheric and subsurface processes, provides a strong rationale for supporting interdisciplinary science and engineering research that uses a systems approach. For the purposes of this announcement, a systems approach is one that emphasizes the interactions among components of the watershed system (human, environmental, technological) and considers the factors that could impact the system if any component were to change. Such research is needed for decision-making that balances restoration, long-term protection, and informed management of water and watersheds with social considerations.

As we assess multiple stressors and the relative risks faced by the nation's aquatic resources and evaluate the natural capital represented in water and watersheds, we need a better knowledge base regarding how humans and their infrastructure interact with these systems. Information on water and watersheds should be assessed and integrated with the needs of decision-makers as a base for identifying areas where improved understanding is needed and for developing the models needed for management of entire watersheds.

This competition emphasizes well-integrated, interdisciplinary, fundamental or applied research on important scientific, engineering, and social principles for understanding, protecting, and restoring water resources and watershed processes in the U.S. and other regions of the world. A systems approach and general applicability of the research to watershed-scale questions are required in each proposal. Investigators are encouraged to bring together formerly disparate, state-of-the-art approaches to address watershed-scale issues and explore new paradigms that draw widely from different disciplines. The competition will only fund proposals that take an integrated systems approach as described in this announcement.

Social science research is defined, for the purposes of this announcement, as research that develops a systemic perspective on, and predictive understanding of, the impacts and spatial aspects of human behavior, institutions, and social and economic systems on water resources and watersheds. The most competitive proposals will be those that include social scientists on the team and propose rigorous research in the social sciences. The social science aspect of a proposal must not be an "add on" but must contribute to and be fully integrated into the research. Note that simply demonstrating applicability of the research to social, economic or management issues is not adequate for the purposes of this competition.

The most competitive proposals will be those that help integrate multiple goals of EPA, NSF, and USDA programs and address questions that are comprehensive in scale and transferable in scope. The degree to which disciplinary components and/or their sub-components are integrated in a systems approach will be a review criterion. Abstracts from the 1995 and 1996 awards may be found on http://www.epa.gov/ncerqa.

2.2 New for 1998

The emphasis of this year's competition will be on research that considers restoration and rehabilitation of damaged or degraded systems. For this competition, the term rehabilitation will capture any and all improvements up to and including complete restoration. The degradation of ecosystem integrity has many components, including but not restricted to: water quality, hydrology and habitat, biological diversity, and effects of exotic species. Degradation presents a serious long-term threat to the nation's economic prosperity and security and the sustainability of remaining ecological systems.

2.3 Background and State of Knowledge

Scientists and engineers agree that ecological restoration of ecosystems is possible. In some cases watersheds and their freshwater ecosystems have been chronically altered for decades or even centuries. In other cases, acute stresses have impacted these systems. Irreversible changes, cost, and institutional and cultural barriers may make rehabilitation of function, but not structure, the only realistic alternative to accommodate the presence of humans. The ecosystem created thereby would function similarly, but not identically, to the natural one. (Robert Naiman et al. 1995, *The Freshwater Imperative: A Research Agenda*, Island Press, Washington, DC).

The challenge for researchers and planners involves scale: because ecosystems are interconnected and interac-

tive, effective rehabilitation efforts should usually be conducted at a scale that includes all significant components of the watershed. This may pose institutional challenges because watersheds often cross political jurisdictions and include diverse economic and cultural subsystems. Assessment of rehabilitation must be on a time frame that enables measurement of how watershed systems endure stressful episodic natural events such as floods, droughts, storms, heavy cyclical predation, invasion by exotics and other perturbations (National Research Council, Water Science and Technology Board, 1992, *Restoration of Aquatic Ecosystems, Science, Technology, and Public Policy,* National Academy Press, Washington, DC).

Key recommendations of the NRC report and the Freshwater Imperative research agenda (NRC 1992; Naiman et al 1995) can be stated as follows:

- Research needs to be focused on systems that can be restored with appropriate action rather than those that will recover without intervention or those that cannot be rehabilitated even with extensive intervention.
- Knowledge is needed on options for simultaneously reducing degradation and enhancing ecosystems to create displaced functions.
- Engineering aspects of restoration must be coupled with a sophisticated understanding of the natural system in question as well as the institutional, socioeconomic and cultural setting of the watershed.
- Research efforts should focus on responses of watershed systems to disturbance, pathways of recovery for key processes, measurement of progress toward new equilibria, and identification of environmental conditions under which systems shift to new equilibrium states.
- Research is also needed on the impacts and spatial aspects of human behavior and social and economic systems that influence the restoration and rehabilitation of water resources and watersheds.

2.4 Description

The U.S. Environmental Protection Agency, the National Science Foundation, and the U.S. Department of Agriculture seek research proposals to address concepts of ecosystem rehabilitation in the context of the watershed system. This competition emphasizes research on important scientific principles related to watershed rehabilitation. Some or all of the following questions should be considered:

(1) What are the ecosystem and societal processes that we must understand before undertaking rehabilitation efforts? Can environmental responses to specific practices be predicted through a knowledge of basic processes regulating watershed systems?

(2) Which set of watershed characteristics are amenable to rehabilitation in the context of environmental and social factors? What kinds of environmental degradation are irreversible for all practical purposes?

(3) How can relative risk and degrees of rehabilitation be monitored and evaluated within their ecological and societal contexts? What metrics or objective criteria should be used to answer the questions "Is it working?" "Is it clean enough?" "Are we doing more harm than good?"

(4) What are both environmentally and economically appropriate approaches for setting rehabilitation priorities and goals at different spatial and temporal scales?

2.5 Review Criteria

In addition to the general review criteria listed in Section 5.0 of this announcement, Water and Watersheds proposals will also be judged on the degree to which the research components are integrated in a systems approach, and the likelihood that the proposed research will effectively address questions that are comprehensive in scale and transferable in scope. This competition encourages research which focuses on a specific site, but through which we can establish general principles and approaches to other sites. Innovative statistical and mathematical approaches are encouraged; however, all proposals are expected to use appropriate mathematical and statistical models and methodologies.

2.6 Additional Considerations

Stakeholder Involvement

The goals of community-based environmental protection are to enhance the community's understanding of environmental issues, build the capacity for communities to address these problems, develop tools, information and data to assist communities in addressing environmental problems, and ensure communities access to the most credible available scientific information. Community-based environmental protection considers an area or subregion from the standpoint of particular cultural, physical, ecological, or other characteristics with which people identify or assign value. A community-based approach is best suited for decision-making at the local to state level.

For the purposes of this competition, the most competitive proposals will demonstrate involvement of local governments and/or community groups from inception (developing the research questions and designing the project) to completion of the research project (analyzing and disseminating the results of the research). Proposals should have a specific geographic focus but the outcomes and outputs must be transferable. Please note that stakeholder involvement alone does not constitute social science research.

Mission Considerations

Restoration of ecological systems has been recognized as a major tool for reaching Clean Water Act goals. As a result, EPA's Five Year Strategic Plan (July 1994) specifies that the Agency will upgrade its ability to protect, maintain, and restore the ecological integrity of the nation's land and water, urban areas, and plant and animal species, including human health, by adopting a place-based focus. Numerous users in academia, industry, and Federal, State, and Local government tap this knowledge to produce products and services essential to achieving sustainable development.

This solicitation complements the ongoing research program in EPA Laboratories. The EPA Office of Research and Development's (ORD) in-house program is focused (1) on the development of ecosystem restoration practices and (2) on technologies that facilitate cost-effective decision-making by local communities and stakeholder groups engaged in watershed planning and place-based environmental protection.

The NSF strategic plan has three long-range goals: (1) to enable the U.S. to uphold a position of world leadership in all aspects of science, mathematics and engineering, (2) to promote the discovery, integration, dissemination, and employment of new knowledge in service to society, and (3) to achieve excellence in U.S. science, mathematics, engineering, and technology education at all levels. All research funded by NSF is expected to contribute to one or more of these goals.

The Cooperative State Research, Education, and Extension Service (CSREES) within USDA has strategic plan goals that focus on environmental research: (1) to generate the knowledge base necessary to address current and potential agricultural and environmental issues through funding of high priority, high quality fundamental and applied research, (2) to strengthen the nation’s scientific, educational, managerial, and leadership capability in food, agricultural, and related environmental and human sciences to meet the current and future needs of agriculture, people, communities, and the nation in a global context, and (3) to promote and strengthen partnerships among USDA, the land-grant system, other federal agencies, and other public and private cooperators and collaborators. Research funded by USDA should contribute to one or more of these goals.

What will NOT be considered

This competition will not support site-specific projects for the sole purpose of restoration. New restoration efforts may be implemented only if the primary purpose is R&D, such as developing or validating models. As a general rule, investigators should attempt to make use of ongoing restoration efforts. Community partnerships are encouraged where the community funds the restoration effort and this grant funds the basic research associated with the questions elaborated above.

International considerations

The EPA, NSF, and USDA recognize that water and watersheds research has an international dimension. Creative research in foreign venues that has very clear transferability to U.S. issues is acceptable, however the investment by the Water and Watersheds competition in such research is expected to be a small proportion of the total.

3.0 ELIGIBILITY

Academic and not-for-profit institutions located in the U.S., and State or local governments are eligible for funding by EPA, NSF, and USDA. Profit making firms and federal agencies are not eligible for funding by EPA or NSF. Personnel in profit-making firms may participate as non-funded co-investigators or through subcontracts with the awardee institution. Profit-making firms and federal agencies are eligible to apply for funding by USDA ($1M of the $9M).

Federal employees may cooperate or collaborate with eligible applicants within the limits imposed by applicable legislation and regulations. However, federal agencies, national laboratories funded by federal agencies (FFRDCs), and federal employees are not eligible to submit applications to this program and may not serve in a principal leadership role on a grant, except for the USDA portion. Under exceptional circumstances the principal investigator's institution may subcontract to a federal agency or FFRDC to purchase unique supplies or services unavailable in the private sector. Examples are purchase of satellite data, census data tapes, chemical reference standards, unique analyses or instrumentation not available elsewhere, etc. A written justification for such federal involvement must be included in the application, along with an assurance from

the federal agency which commits it to supply the specified service. Federal employees may not receive salaries or in other ways augment their agency's appropriations through grants made by this program. Potential applicants who are uncertain of their eligibility should contact Dr. Robert E. Menzer (listed in Section 1.0).

EPA, NSF, and USDA welcome applications on behalf of all qualified scientists, engineers, and other professionals and strongly encourage women, minorities, and persons with disabilities to compete fully in any of the programs described in this announcement.

In accordance with Federal statutes and regulations and EPA, NSF, and USDA policies, no person on grounds of race, color, age, sex, national origin, or disability shall be excluded from participation in, denied the benefits of, or be subjected to discrimination under any program or activity receiving financial assistance from EPA, NSF, and USDA.

4.0 INSTRUCTIONS FOR APPLICATION SUBMISSION

4.1 Sorting Codes

In order to facilitate proper assignment and review of applications, each applicant is asked to identify the topic area in which the application is to be considered. It is the responsibility of the applicant to correctly identify the proper sorting code. Failure to do so may result in an improper review assignment. At various places within the application, applicants will be asked to identify this topic area by using the appropriate Sorting Code. **The Sorting Code for Water and Watersheds is 98-NCERQA-M1.**

The Sorting Code must be placed at the top of the abstract (as shown in the abstract format), on the title page (as shown in the title page format), and must also be included in the address on the package that is sent to EPA (see section 4.3). EPA, NSF or USDA may reassign proposals to other or multiple sorting categories to ensure optimal review of proposals.

4.2 The Application

The initial application is made through the submission of the application materials described below. It is important that the application contain all the information requested and be submitted in the formats described. If it is not, the application may be eliminated from review on administrative grounds. Once an applicant is chosen for award (i.e., after external peer review and internal programmatic review), additional documentation and forms will be requested by the Project Officer. The application contains the following:

A. **Standard Form 424:** The applicant must complete Standard Form 424 (see attached form and instructions). This form will act as a cover sheet for the application and **should be its first page.** Instructions for completion of the SF424 are included with the form. The form must contain the original signature of an authorized representative of the applying institution. Please note that both the Principal Investigator and an administrative contact should be identified in Section 5 of the SF424.

B. **Key Contacts:** The applicant must complete the Key Contacts Form (attached) as the second page of the submitted application.

C. **Abstract: The abstract is a very important document.** Prior to attending peer review panel meetings, some of the panelists may read only the abstract. Therefore, it is critical that the abstract accurately describe the research being proposed and convey all the essential elements of the research. Also, in the event of an award, the abstracts will form the basis for an annual report of awards made under this program. The abstract should include the following information:

1. **Sorting Code:** Use 98-NCERQA-M1.

2. **Title:** Use the exact title as it appears in the rest of the application.

3. **Investigators:** List the names and affiliations of each investigator who will significantly contribute to the project. Start with the Principal Investigator.

4. **Project Summary:** This should summarize: (a) the **objectives** of the study (including any hypotheses that will be tested), (b) the experimental **approach** to be used (which should give an accurate description of the project as described in the proposal), (c) the **expected results** of the project and how they address the research needs identified in the solicitation, and (d) the estimated **improvement in risk assessment or risk management** that will result from successful completion of the work proposed.

5. **Supplemental Keywords:** A list of suggested keywords is provided for your use. Do not duplicate terms already used in the text of the abstract.

The abstract must not exceed one 8.5x11 inch page of single spaced standard 12 point type with 1 inch margins (see attached format).

D. Project Description: This description must not exceed fifteen (15) consecutively numbered (center bottom), 8.5x11 inch pages of single spaced standard 12 point type with 1 inch margins, exclusive of the references cited and the results of prior Federal support. The description must provide the following information:

1. Objectives: List objectives of the proposed research and/or the hypotheses being tested during the project. Include a statement on the context of the proposed research in relation to other environmental research in the particular area of work; this statement should also be synopsized in the objectives section of the abstract.

2. Approach: Outline the methods, approaches, and techniques that you intend to employ in meeting the objective stated above.

3. Expected Results or Benefits: Describe the results you expect to achieve during the project and the benefits of success as they relate to the topics in the announcement under which the proposal was submitted.

4. Results from Prior Federal Support: Provide information on the results of research conducted with prior or current Federal support. This must be limited to five pages but is in addition to the 15-page limit. This section should include information on any prior *Federal* awards closely related to the application (i.e., not limited to EPA or NSF awards).

5. General Project Information: Discuss other information relevant to the potential success of the project. This should include facilities, personnel, project schedules, proposed management, interactions with other institutions, etc.

6. Important Attachments: Appendices or other information may be included but must remain within the 15-page limit. References and Results of Prior Federal Support are in addition to the 15-page limit.

E. Resumes: The resumes of all principal investigators and important co-workers should be presented using NCERQA Form 5, attached. Resumes must not exceed two consecutively numbered (bottom center), 8.5x11 inch pages of single-spaced standard 12 point type with 1 inch margins.

F. Current and Pending Support: The applicant must identify any current and pending financial resources that are intended to support research. This should be done by Completing NSF Form 1239 (see attached) for each investigator and other senior personnel involved in the proposal. Failure to provide this information may delay consideration of your proposal. Updates of this information may be requested during the evaluation process.

G. Budget: A detailed, itemized budget for each year of the proposed project must be included. This budget must utilize the format shown in the attachment (do not try to squeeze your complete budget on the "form" shown as an example).

H. Budget Justification: This section should describe the basis for calculating the personnel, fringe benefits, travel, equipment, supplies, contractual support, construction, and other costs identified in the itemized budget. This should also include an explanation of how the indirect costs and charges were calculated. This justification should not exceed two consecutively numbered (bottom center), 8.5x11 inch pages of single-spaced standard 12 point type with 1 inch margins.

I. Quality Assurance Narrative Statement: For any project involving data collection or processing, conducting surveys, environmental measurements, and/or modeling, provide a statement on how quality products will be assured. This statement should not exceed two consecutively numbered, 8.5x11 inch pages of single spaced standard 12-point type with 1 inch margins. This is in addition to the 15 pages permitted for the Project Description. The Quality Assurance Narrative Statement should, for each item listed below, either present the required information or provide a justification as to why the item does not apply to the proposed research. For awards that involve environmentally related measurements or data generation, a quality system that complies with the requirements of ANSI/ASQC E4, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs," must be in place.

1. The activities to be performed or hypothesis to be tested (reference may be made to the specific page and paragraph number in the application where this information may be found); criteria for determining the acceptability of data quality in terms of precision, accuracy, representativeness, completeness, comparability.

2. The study design including sample type and location requirements and any statistical analyses that were used to estimate the types and numbers of samples required for physical samples or similar information for studies using survey and interview techniques.

3. The procedures for the handling and custody of samples, including sample identification, preservation, transportation, and storage.

4. The methods that will be used to analyze samples collected, including a description of the sampling and/or analytical instruments required.

5. The procedures that will be used in the calibration and performance evaluation of the sampling and analytical methods used during the project.

6. The procedures for data reduction and reporting, including a description of statistical analyses to be used and of any computer models to be designed or utilized associated with verification and validation techniques.

7. The intended use of the data as they relate to the study objectives or hypotheses.

8. The quantitative and or qualitative procedures that will be used to evaluate the success of the project.

9. Any plans for peer or other reviews of the study design or analytical methods prior to data collection.

ANSI/ASQC E4, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs" is available for purchase from the American Society for Quality Control, phone 1-800-248-1946, item T55. Only in exceptional circumstances should it be necessary to consult this document.

J. Postcard: The application must include a blank, self-addressed, stamped post card. This will be returned to the applicant to signify that the application has been received.

4.3 How to Apply

The original and fifteen (15) copies of the fully developed application and five (5) additional copies of the abstract (20 in all), must be received by NCERQA no later than **4:00 P.M. EST** on the closing date, **April 1, 1998.**

The application and abstract must be prepared in accordance with these instructions. Informal, incomplete, or unsigned proposals will not be considered. Completed applications should be sent via regular mail to:

U.S. Environmental Protection Agency
Peer Review Division (8703R)
Sorting Code: 98-NCERQA-M1
401 M Street, SW
Washington DC 20460

For express mail applications, the following address must be used:

U. S. Environmental Protection Agency
Peer Review Division (8703R)
Sorting Code: 98-NCERQA-M1
1300 Pennsylvania Avenue, NW
Room B-10105
Washington, DC 20004

Phone: (202) 564-6939 (for express mail applications)

Proposals must be submitted to only one topic area, using a single sorting code. Proposals submitted to more than one RFA topic will be assigned to the topic designated on the first version received or to the first sorting code designated on the application. If you wish to submit more than one application to EPA, NSF, or USDA, you must ensure that the research proposed is significantly different from the research in other proposals that have been submitted to this solicitation or from other grants you are currently receiving from any Federal government agency.

4.4 Guidelines, Limitations, and Additional Requirements

Applicants that are funded by USDA must agree to the legislated indirect cost rate of 14%.

Subcontracts for research to be conducted under the grant which exceed 40% of the total direct cost of the grant for each year in which the subcontract is awarded must be especially well justified.

Researchers may be invited to participate in an annual All-Investigators Meeting with EPA, NSF and USDA scientists and other grantees to report on research activities and to discuss areas of mutual interest. Travel funds should be budgeted to accommodate that eventuality.

The application must include a blank, self-addressed, stamped post card. This will be returned to the applicant to signify that the application has been received.

5.0 REVIEW AND SELECTION

5.1 Review Procedures

All grant applications are initially screened by EPA, NSF, and USDA to determine their compliance with legal and administrative requirements. Acceptable applications are then reviewed by an appropriate technical peer review group. This review is designed to evaluate each proposal according to its technical merit. Each review group is composed primarily of non-EPA scientists, engineers, and/or social scientists who are experts in their respective

disciplines. The reviewers use the following criteria to guide them in their reviews:

1. The originality and creativity of the proposed research, the potential contribution the proposed research could make to advance scientific knowledge in the environmental area, the appropriateness and adequacy of the research methods proposed, and the appropriateness and adequacy of the Quality Assurance Narrative Statement,

2. The qualifications of the principal investigator(s) and other staff, including knowledge of pertinent literature, experience, and publication records as well as the likelihood that the proposed research will be successfully completed.

3. The availability and/or adequacy of the facilities and equipment proposed for the project.

4. The responsiveness of the proposal to the research needs set forth in this solicitation.

5. Although budget information is not used by the reviewers as the basis for their evaluation of scientific merit, the reviewers are asked to provide their input on the appropriateness and/or adequacy of the proposed budget and its implications on the potential success of the proposed research. Input on requested equipment is of particular interest.

Grants are selected on the basis of technical merit, relevancy to the research priorities outlined, program balance, and budget. In addition to the above criteria, other factors that will be taken into consideration by NSF in the evaluation and award process are described in section 6.4, paragraph 3.

Copies of the evaluations by the technical reviewers will be provided to each applicant. Funding decisions are the sole responsibility of EPA and NSF.

5.2 Proprietary Information

By submitting an application in response to this solicitation, the applicant grants EPA, NSF, and USDA permission to share the application with technical reviewers both within and outside the Agencies. Applications containing proprietary or other types of confidential information **will not** be reviewed.

6.0 GRANT ADMINISTRATION

Upon conclusion of the review process, meritorious applications may be recommended for funding by either EPA, NSF, or USDA at the option of the agencies, not the applicant. Subsequent grant administration procedures will be in accordance with the individual policies of the awarding agency.

6.1 EPA Grant Administration

The funding mechanisms for all awards issued under this solicitation will consist of grant agreements between EPA and the recipient. In accordance with Public Law 95-224, grants are used to accomplish a public purpose of support or stimulation authorized by Federal statute rather than acquisition for the direct benefit of the Agency. In using a grant agreement, EPA anticipates that there will be no substantial involvement during the course of the grant between the recipient and the Agency.

EPA grants awarded as a result of this announcement will be administered in accordance with 40 CFR Part 30 and 40 or the most recent FDP terms and conditions, depending upon the grantee institution.

EPA provides awards for research in the sciences and engineering related to environmental protection. The awardee is solely responsible for the conduct of such activities and preparation of results for publication. EPA, therefore, does not assume responsibility for such findings or their interpretation.

6.2 NSF Grant Administration

NSF grants awarded as a result of this announcement will be administered in accordance with the terms and conditions of the most recent NSF GC-1, "Grant General Conditions," or the FDP-III, "Federal Demonstration Partnership General Terms and Conditions," depending on the grantee organization.

More comprehensive information on the administration of NSF grants is contained in the Grant Policy Manual (NSF 95-26, July 1995), for sale through the Superintendent of Documents, Government Printing Office (GPO), Washington, D.C. 20402. The telephone number at GPO is (202) 512-1800 for subscription information. The manual is also available on the Internet at: www.nsf.gov

Organizations applying to NSF for the first time, or which have not received an NSF award within the preceding two years, should refer to the NSF Grant Policy Manual, Section 500, for instructions on specific informa-

tion that may be requested by NSF. First time NSF awardees will be required to submit organizational, management, and financial information, including a certification of civil rights compliance, before a grant can be made. One copy of the Grant Policy Manual will be provided free of charge to new grantees.

Upon completion of an NSF project, a Final Project Report (NSF Form 98A) form will be sent to the grantee. Applicants should review this form prior to proposal submission so that appropriate tracking mechanisms are included in the proposal plan to ensure that complete information will be available at the conclusion of the project.

NSF activities described in this publication are in the following categories in the Catalog of Federal Domestic Assistance (CFDA): 47.041 Engineering; 47.049 Mathematical and Physical Sciences; 47.050 Geosciences; 47.074 Biological Sciences; 47.075 Social, Behavioral and Economic Sciences.

6.3 USDA Grant Administration

USDA award authority for this program is contained in section 2(b) of the Act of August 4, 1965, as amended (7U.S.C.450i(b)). Under this program, subject to the availability of funds, the Secretary may award competitive research grants, for periods not to exceed five years, for the support of the research projects to further programs of the Department of Agriculture (USDA). Proposals may be submitted by any state agricultural station, college, private organization, corporation, or individual. Proposals from scientists at non-United States organizations will not be considered for support. Funds available to pay indirect costs on research grants awarded competitively by CREES may not exceed 14 per centum of the total Federal funds provided under each ward. Entities are encouraged to purchase only American equipment or products.

6.4 NSF Applicant Information

The Foundation provides awards for research and education in the sciences and engineering. The awardee is wholly responsible for the conduct of such research and preparation of the results for publication. The Foundation, therefore, does not assume responsibility for the research findings or their interpretation.

The Foundation welcomes proposals from all qualified scientists and engineers and strongly encourages women, minorities, and persons with disabilities to compete fully in any of the research and education related programs described here. In accordance with federal statutes, regulations, and NSF policies, no person on grounds of race, color, age, sex, national origin, or disability shall be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving financial assistance from the National Science Foundation.

NSF will consider in its evaluation and award process the broader impacts of the proposed research activity, in addition to addressing the criteria stated in section 5.1. Questions to be considered are: How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, geographic, etc.)? To what extent will it enhance the infrastructure for research and educaton, such as facilities, instrumentation, networks and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

Facilitation Awards for Scientists and Engineers with Disabilities (FASED) provide funding for special assistance or equipment to enable persons with disabilities (investigators and other staff, including student research assistants) to work on NSF projects. See the program announcement or contact the program coordinator at (703) 306-1636.

Privacy Act. The information requested on proposal forms is solicited under the authority of the National Science Foundation Act of 1950, as amended. It will be used in connection with the selection of qualified proposals and may be disclosed to qualified reviewers and staff assistants as part of the review process; to applicant institutions/grantees; to provide or obtain data regarding the application review process, award decisions, or the administration of awards; to government contractors, experts, volunteers, and researchers as necessary to complete assigned work; and to other government agencies in order to coordinate programs. See Systems of Records, NSF 50, Principal Investigators/Proposal File and Associated Records, and NSF-51, 60 Federal Register 4449 (January 23, 1995), Reviewer/Proposal File and Associated Records, 59 Federal Register 8031 (February 17, 1994).

Public Burden. Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of your receiving an award.

The public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding this burden estimate or any other

aspect of this collection of information, including suggestions for reducing this burden, to Gail A. McHenry, Reports Clearance Officer, Information Dissemination Branch, National Science Foundation, 4201 Wilson Boulevard, Suite 245, Arlington, VA 22230.

The National Science Foundation has TDD (Telephonic Device for the Deaf) capability, which enables individuals with hearing impairment to communicate with the Foundation about NSF programs, employment, or general information. To access NSF TDD, dial (703) 306-0090; for FIRS, 1-800-877-8339.

OMB Approval No. 0348-0043

APPLICATION FOR FEDERAL ASSISTANCE

2. DATE SUBMITTED	Applicant Identifier
3. DATE RECEIVED BY STATE	State Applicant Identifier
4. DATE RECEIVED BY FEDERAL AGENCY	Federal Identifier

1. TYPE OF SUBMISSION

Application	*Preapplication*
☐ Construction	☐ Construction
☐ Non-Construction	☐ Non-Construction

5. APPLICANT INFORMATION — IS THIS PROPOSAL BEING SUBMITTED TO ANOTHER FEDERAL AGENCY? ☐ YES ☐ NO IF YES, LIST ACRONYM(S)

Legal Name:

Organizational Unit:

Address ***(give city, county, state, and zip code)***:

Name and telephone and E-mail number of the person to be contacted on matters involving this application ***(give area code)***

PI:

ADMIN. CONTACT:

6. EMPLOYER IDENTIFICATION NUMBER (EIN):

☐☐ – ☐☐☐☐☐☐☐

7. TYPE OF APPLICANT: ***(enter appropriate letter in box)*** ☐

A. State
B. County
C. Municipal
D. Township
E. Interstate
F. Intermunicipal
G. Special District
H. Independent School Dist.
I. State Controlled Institution of Higher Learning
J. Private University
K. Indian Tribe
L. Individual
M. Profit Organization
N. Other (Specify) _____

8. TYPE OF APPLICATION:

☐ New ☐ Continuation ☐ Revision

If Revision, enter appropriate letter(s) in box(es): ☐ ☐

A. Increase Award B. Decrease Award C. Increase Duration
D. Decrease Duration Other ***(specify):***

_____

9. NAME OF FEDERAL AGENCY:

U.S. Environmental Protection Agency - ORD - NCERQA

10. CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER: 6 6 • 5 0 0

TITLE: **98-NCERQA -** _ _ _

11. DESCRIPTIVE TITLE OF APPLICANT'S PROJECT:

12. AREAS AFFECTED BY PROJECT ***(cities, counties, states, etc.):***

13. PROPOSED PROJECT:		14. CONGRESSIONAL DISTRICTS OF:	
Start Date	Ending Date	a. Applicant	b. Project

15. ESTIMATED TOTAL PROJECT FUNDING:		
a. Federal	$	.00
b. Applicant	$	.00
c. State	$	.00
d. Local	$	.00
e. Other	$	.00
f. Program Income	$	.00
g. TOTAL	$	.00

16. IS APPLICATION SUBJECT TO REVIEW BY STATE EXECUTIVE ORDER 12372 PROCESS?

a. YES. THIS PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW ON:

DATE _____

b. NO. ☐ PROGRAM IS NOT COVERED BY E.O. 12372

☐ OR PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW

17. IS THE APPLICANT DELINQUENT ON ANY FEDERAL DEBT?

☐ Yes If "Yes," attach an explanation. ☐ No

18. TO THE BEST OF MY KNOWLEDGE AND BELIEF, ALL DATA IN THIS APPLICATION/PREAPPLICATION ARE TRUE AND CORRECT. THE DOCUMENT HAS BEEN DULY AUTHORIZED BY THE GOVERNING BODY OF THE APPLICANT AND THE APPLICANT WILL COMPLY WITH THE ATTACHED ASSURANCES IF THE ASSISTANCE IS AWARDED.

a. Typed Name of Authorized Representative	b. Title	c. Telephone number
d. Signature of Authorized Representative		e. Date Signed

Previous Editions Not Usable
Prescribed by OMB Circular A-102

Standard For 424 (REV 4-88)

Authorized for Local Reproduction

INSTRUCTIONS FOR THE SF 424

This is a standard form used by applicants as a required facesheet for preapplications and applications submitted for Federal Assistance. It will be used by Federal agencies to obtain applicant certification that States which have established a review and comment procedure in response to Executive Order 12372 and have selected the program to be included in their process, have been given an opportunity to review the applicant's submission.

Item: Entry:

1. Self-explanatory.

2. Date application submitted to Federal agency (or State, if applicable) & applicant's control number (if applicable).

3. State use only (if applicable).

4. If this application is to continue or revise an existing award, enter present Federal identifier number. If for a new project, leave blank.

5. Legal name of applicant, name of primary organizational unit which will undertake the assistance activity, complete address of the applicant, and name and telephone number of the person to contact on matters related to this application.

6. Enter Employer Identification Number (EIN) as assigned by the Internal Revenue Service.

7. Enter the appropriate letter in the space provided.

8. Check appropriate box and enter appropriate letter(s) in the space(s) provided:

   — "New" means a new assistance award.

   — "Continuation" means an extension for an additional funding/budget period for a project with a projected completion date.

   — "Revision" means any change in the Federal Government's financial obligation or contingent liability from an existing obligation.

9. Name of Federal agency from which assistance is being requested with this application.

10. Use the Catalog of Federal Domestic Assistance number and title of the program under which assistance is required.

11. Enter a brief descriptive title of the project. If me than one program is involved, you should append an explanation on a separate sheet. If appropriate (e.g., construction or real property projects), attach a map showing project location. For preapplications, use a separate sheet to provide a summary description of this project.

Item: Entry:

12. List only the largest political entities affected (e.g., State, counties, cities.)

13. Self-explanatory.

14. List the applicant's Congressional Districts and any District(s) affected by the program or project.

15. Amount requested or to be contributed during the first funding/budget period by each contributor. Value of in-kind contributions should be included on appropriate lines as applicable. If the action will result in a dollar change to an existing award, include *only* the amount of the change. For decreases, enclose the amounts in parentheses. If both basic and supplemental amounts are included, show breakdown on an attached sheet. For multiple program funding, use totals and show breakdown using same categories as item 15.

16. Applicants should contact the State Single Point of Contact (SPOC) for Federal Executive Order 12372 to determine whether the application is subject to the State intergovernmental review process.

17. This question applies to the applicant organization, not the person who signs as the authorized representative. Categories of debt include delinquent audit allowances, loans and taxes.

18. To be signed by the authorized representative of the applicant. A copy of the governing body's authorization for you to sign this application as official representative must be on file in the applicant's office. (Certain Federal agencies may require that this authorization be submitted as part of the application.

KEY CONTACTS FORM

■ **Authorized Representative:** *Original awards and amendments will be sent to this individual for review and acceptance, unless otherwise indicated.*

Name: _____
Title: _____
Complete Address: _____

_____
Phone Number: _____

■ **Payee:** *Individual authorized to accept payments.*

Name: _____
Title: _____
Complete Address: _____

_____
Phone Number: _____

■ **Administrative Contact:** *Individual from Sponsored Programs Office to contact concerning administrative matters (i.e., indirect cost rate computation, rebudgeting requests etc.)*

Name: _____
Title: _____
Complete Address: _____

_____
Phone Number: _____
FAX Number: _____
E-Mail Number: _____

■ **Principal Investigator:** *Individual responsible for the technical completion of the proposed work.*

Name: _____
Title: _____
Complete Address: _____

_____
Phone Number: _____
FAX Number: _____
E-Mail Number: _____

EPA STAR Grant Abstract *(Example Format)*

Sorting Code: *98-NCERQA-XX (use the correct code that corresponds to the appropriate RFA topic)*
Title: *Use the exact title as it appears in the rest of the application.*
Investigators: *List the names and affiliations of each investigator who will significantly contribute to the project. Start with the Principal Investigator.*
Institution: *Name of university or other applicant.*
Project Period: *October 1, 1998--September 30, 2000, for example.*
Research Category: *Enter your research topic name.*

Project Summary:

Objectives/Hypothesis: *include a short statement on the context of the proposed research in relation to other environmental research in the particular area of work*

Approach: *outline the methods, approaches, and techniques you intend to employ in meeting the objectives*

Expected Results:

including a brief description of the
Improvements in Risk Assessment or Risk Management
that will be realized if the expected results are achieved

Supplemental Keywords: *see attached suggestions. Do not duplicate terms used in the text of the abstract.*

SUGGESTED KEYWORDS

Media: (media, air, ambient air, atmosphere, ozone, water, drinking water, watersheds, groundwater, land, soil, sediments, acid deposition, global climate, indoor air, mobile sources, CASTNET, stratospheric ozone, tropospheric, marine, estuary, precipitation, leachate, adsorption, absorption, chemical transport)

Risk Assessment: (exposure, risk, risk assessment, effects, health effects, ecological effects, human health, bioavailability, metabolism, vulnerability, sensitive populations, dose-response, carcinogen, teratogen, mutagen, animal, mammalian, organism, cellular, population, enzymes, infants, children, elderly, stressor, age, race, diet, metabolism, genetic pre-disposition, genetic polymorphisms, sex, ethnic groups, susceptibility, cumulative effects)

Chemicals, toxics, toxic substances: (chemicals, toxics, particulates, ODS, VOC, CFC, PAH, PNA, PCB, dioxin, metals, heavy metals, solvents, oxidants, nitrogen oxides, sulfates, organics, DNAPL, NAPL, pathogens, viruses, bacteria, acid rain, effluent, discharge, dissolved solids, intermediates)

Ecosystem Protection: (ecosystem, indicators, restoration, regionalization, scaling, terrestrial, aquatic, habitat, integrated assessment)

Risk Management: pollution prevention (green chemistry, life-cycle analysis, alternatives, sustainable development, clean technologies, innovative technology, renewable, waste reduction, waste minimization, environmentally conscious manufacturing); treatment (remediation, bioremediation, cleanup, incineration, disinfection, oxidation, restoration)

Public Policy: (public policy, decision making, community-based, cost-benefit, conjoint analysis, observation, non-market valuation, contingent valuation, survey, psychological, preferences, public good, Bayesian, socio-economic, willingness-to-pay, compensation, conservation, environmental assets, sociological)

Scientific Disciplines: (environmental chemistry, marine science, biology, physics, engineering, social science, ecology, hydrology, geology, histology, epidemiology, genetics, pathology, mathematics, limnology, entomology, zoology)

Methods/Techniques: (EMAP, modeling, monitoring, analytical, surveys, measurement methods, general circulation models, climate models, satellite, landsat, remote sensing)

Geographic Areas: (Northeast, central, Northwest, Chesapeake Bay, Great Lakes, Midwest, Mid-Atlantic, states: {use both full name and two letter abbreviation}, EPA Regions 1 through 10)

Sectors: (agriculture, business, transportation, industry {petroleum, electronics, printing, etc}:{identify 4 digit SIC codes}, service industry, food processing, etc)

BIOGRAPHICAL SKETCH

Provide the following information for the senior personnel on the project. Begin with the Principal Investigator/Project Director (PI/PD).

DO NOT EXCEED 2 PAGES PER PERSON

A. Vitae, listing professional and academic essentials and mailing address.
B. List up to 5 publications most closely related to the proposed project and up to 5 other significant publications, including those accepted for publication. Patents, copyrights or software systems developed may be substituted for publications. Do not include additional lists of publications, invited lectures, etc. Only the list of up to 10 will be used in merit review.
C. A list of persons (including their organizational affiliations) who have collaborated on a project or a book, article, report or paper within the last 48 months, including collaborators on this proposal. If there are no other collaborators, this should be indicated.
D. A list of the names of persons (including their organizational affiliations) over the past five years, with whom this individual has had an association as thesis advisor and postdoctoral scholar sponsor. Also include a summary of the total number of graduate students advised and postdoctoral scholars sponsored.
E. The names and institutions of this individual's own graduate and postgraduate advisors.

The information in C, D, and E is used to help identify potential conflicts or bias in the selection of reviewers.

Current and Pending Support

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator:	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ Transfer of Support
Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project. Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ Transfer of Support
Project/Proposal Title:

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Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project. Cal: Acad: Sumr:

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Itemized Budget for EPA STAR Grant Applications *(Example Format)*

CATEGORIES	YEAR ONE	YEAR TWO	YEAR THREE	TOTAL PROJECT
a. Personnel Principal Investigator Co-PI Research Scientists Postdoctoral Scientists Other Personnel				
TOTAL PERSONNEL COSTS				
b. Fringe Benefits _____% of _____				
c. Travel Trip 1 Trip 1 Trip 1 ...etc.				
TOTAL TRAVEL COSTS				
d. Equipment Item 1 Item 2 Item 3 ...etc.				
TOTAL EQUIPMENT COSTS				
e. Supplies Item 1 Item 2 Item 3 ...etc.				
TOTAL SUPPLY COSTS				
f. Contracts 1 2 3 ...etc.				
TOTAL CONTRACTUAL COSTS				
g. Other Item 1 Item 2 Item 3 ...etc.				
TOTAL OTHER COSTS				
h. TOTAL DIRECT COSTS (sum of a-g)				
i. Indirect Costs/Charges _____% of _____ (base)				
j. TOTAL PROJECT COSTS (sum of h & i)				
k. TOTAL REQUESTED FROM EPA				

DO NOT USE THIS FORM -- Example 0nly --